



# UNITED STATES PATENT AND TRADEMARK OFFICE

*Clu*  
UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,011	07/08/2003	Daniel Lyle Callahan	200308561-1	8183

22879 7590 04/05/2007  
HEWLETT PACKARD COMPANY  
P O BOX 272400, 3404 E. HARMONY ROAD  
INTELLECTUAL PROPERTY ADMINISTRATION  
FORT COLLINS, CO 80527-2400

EXAMINER
----------

DINH, TUAN T

ART UNIT	PAPER NUMBER
----------	--------------

2841

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/05/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/615,011

Applicant(s)

CALLAHAN ET AL.

Examiner

Tuan T. Dinh

Art Unit

2841

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 3,4,6,7,10-16 and 19-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20-24 is/are allowed.
- 6) ☒ Claim(s) 3-4,6-7,10-16,19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 3-4, 6-7, 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beaman et al. (U.S. Patent 5,738,531) in view of Gonzalez et al. (U.S. Patent 6,657,131).

As to claim 3, Beaman et al. discloses an electronic component system as shown in figures 1-5 comprising:

a land grid array module (1-figure 4);

a printed circuit board (10, column 4, line 12) having first and second sides;

an interposer (3, column 4, line 3) disposed between the module (1) and the first side of the printed circuit board (10);

a backing/stiffening plate (19-figure 5) spaced from, and disposed on the second side of the printed circuit board (10) opposite the first side;

a plurality of posts (22) extending through and connecting the module (1), the printed circuit board (10 or 21-figure 5), the interposer (3 or 24-figure 5), and the backing plate (19) relative to each other; and

a spring member (an insulator 23-figure 5 made by a polyimide, see column 4, lines 5-57) disposed between the backing plate (19) and the second side of the printed circuit board (21), and having a first outer portion (a leg including a crew hole) in secured contact with the backing plate (19) slidably mounted on each of the posts, and a second center inner portion (a body of the insulator 23) in unsecured.

Beaman does not disclose the spring member (23) being a convexity and pressing contact against the second side of the printed circuit board at a center of the printed circuit board, biased to exert a compressive force against the center of the PCB,, and the curved spring member retains a generally curved shape in both an unassembled state of the system and in an assembled stated of the system.

Gonzalez et al. shows an apparatus as shown in figures 2, 7-8 comprising a disk-shaped elastically deformable plate (400) having a first outer portion secured to a printed circuit board (104) by post (106), and a second inner portion (402) is unsecured and pressing contact against the second side of the printed circuit board (by force 406, see figure 2) at a center of the printed circuit board (104), the plate (400) retains a generally curved shape in both an unassembled state of the system and in an assembled stated of the system.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching of Gonzalez et al. employed in the system of Beaman in order to provide an isolation and even pressure of forces applied on the PCB.

As to claims 4, 6, Beaman as modified discloses the second portion (the body) of the spring member (23) comprises a central body portion and the first portion (the leg including the crew hole) of the spring member comprises a plurality of leg members radially extending outward from the central body portion with an end of each leg member including a hole (see figure 5) configured for receiving one of the posts (22) to secure the spring member relative to the backing plate (19).

As to claim 7, Beaman discloses the central body portion defines a body of material formed without holes, see figure 5.

As to claim 10, Beaman discloses the spring member (23) is a single member that provides the substantially all of the compressive clamping force on the system.

As to claims 11-13, Beaman et al. discloses a force distributing mechanism as shown in figures 1-5 comprising:

means for securing (3) a land grid array module (1) and a printed circuit board (10) in electrical communication with each other including introducing a contact force between an array of contact elements of the land grid array module (1) and an array of contact elements of the printed circuit board (10);; and

means for maintaining and distributing (23) the contact force substantially uniformly across the contact array of the land grid array module (1) and the contact array of the printed circuit board (10), the means for maintaining and distributing the contact force being in direct contact with the printed circuit board (10).

wherein the means for securing **comprises (claim 12)**:

an interposer (3) disposed between the land grid array module (1) and the printed circuit board (10);

a plurality of load posts (22) extending through each of the land grid array module (1), the printed circuit board (10), the interposer (3), and the means for maintaining and distributing (23) the contact force; and

a stiffening plate (19) disposed on a side of the printed circuit board (10) opposite the interposer (3) and the land grid array module (1), and fixed to the load posts (22) to be spaced from the printed circuit board (10).

Beaman does not disclose the spring member (23) being curved and pressing contact against the second side of the printed circuit board adjacent a center of the printed circuit board.

Gonzalez et al. shows an apparatus as shown in figures 2, 7-8 comprising a disk-shaped elastically deformable plate (400) having a first outer portion secured to a printed circuit board (104) by post (106), and a second inner portion (402) is unsecured and pressing contact against the second side of the printed circuit board (by force 406, see figure 2) at a center of the printed circuit board (104), the plate (400) retains a generally curved shape in both an unassembled state of the system and in an assembled stated of the system.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching of Gonzalez et al. employed in the system of Beaman in order to provide an isolation and even pressure of forces applied on the PCB.

As to claim 14, Beaman as modified discloses the second portion (the body) of the spring member (23) comprises a central body portion and the first portion (the leg including the crew hole) of the spring member comprises a plurality of leg members radially extending outward from the central body portion with an end of each leg member including a hole (see figure 5) configured for receiving one of the posts (22) to secure the spring member relative to the backing plate (19).

3. Claims 15-16, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beaman (531) in view of Gonzalez ('131), and further in view of Haselby et al. (U.S. Patent 6,299,460).

As to claims 15-16, 19, Beaman as modified by Gonzalez disclose all of the limitations of the claimed invention except for the means for securing the module comprising: a plurality of load springs carried on the load posts.

Haselby et al. teaches an assembly as shown in figure 1 comprising posts (34) having spring loads (36, 38).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching of Haselby et al. employed in the system of Beaman and Gonzalez et al. in order to reduce force when the posts applied on the assembly.

***Allowable Subject Matter***

4. Claims 20-22 are allowed.

The following is an examiner's statement of reasons for allowance: Neither the references cited nor the cited references do disclose the second portion of the spring member comprises a cured central body portion and wherein the backing plate includes a recessed portion defined in a main body of the backing plate that is configured to receive the first portion ends of the spring member.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

#### ***Response to Arguments***

5. Applicant's arguments with respect to claims 3-4, 6-7, 10-16, and 19-24 have been considered but are moot in view of the new ground(s) of rejection.

#### ***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the



shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T. Dinh whose telephone number is 571-272-1929. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reichard Dean can be reached on 571-272-1984. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Tuan Dinh', with a stylized flourish at the end.

Tuan Dinh  
March 28, 2007.